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Methods to construct de Bruijn Rings using circulant matrices

A de Bruijn torus is a two dimensional extension of a de Bruijn sequence. For modern robotics, the full tori is not always needed. Exclusions of periodic windows leads to a more practical tori known as a de Bruijn Ring. We have developed novel methods to generate these de Bruijn rings using linear circulant matrices over finite fields, named Circulant Shifters. In this talk we review this generation method, as well as methods classify these shifters and families of these shifters that can generate de Bruijn rings.